General discussion
INTRODUCTION

In the last decade of the 20th century, sick leave and disability rates were high in the Netherlands, and legislation changed in order to reduce these rates. This resulted in changes in responsibilities for employers, employees and occupational health physicians (OHPs). Employers became more and more financially responsible for workers compensation payments, employees were obliged to comply with adequate treatment regimens. Mandatory in case of a sick leave spell > 6 weeks, OHPs had to support employers and employees with a problem analysis considering the causes and factors associated with this sick leave spell. This problem analysis is the starting point for return to work (RTW) management. Not complying with this legislation could endanger the claim for a disability pension, and RTW became an important goal for all stakeholders in the process.

Sick leave has negative consequences, both for employers and employees. Employers face the costs of lost productivity, replacement and RTW management; employees cannot participate in the important societal role of work. However, sick leave may also be necessary for the employee to regain health and work ability.

The term ‘sick leave’ suggests an important, if not crucial, role for health conditions in the decision of an employee to be absent from his/her work. This may be true from the viewpoint of legislation, where the existence of an illness is mandatory for the right to workers compensation, but in everyday practice other than health factors are important in an employee’s decision to list sick. Various models described the influence of personal and environmental factors in a conceptual way. The introduction of the International Classification of Functioning, Disability and Health (ICF) in 2001 offered a framework to study the relation between health conditions and impaired societal participation, defining qualitative and quantitative aspects of the components in the ICF model.

Because of the high costs of absence due to illness, RTW management got a lot of attention, both from employers and from OHPs. In RTW management, besides RTW to normal working hours and duties, aspects of work functioning and sustainability should be taken into account.

The objective of this thesis was to generate knowledge about the factors that are associated with outcomes of sick leave spells, both in the phase that the employee is on sick leave and in the phase after RTW. For this purpose associations of sociodemographic, medical and work related determinants with various outcomes of sick leave spells, i.e. (time to) RTW, job loss, sustainability of RTW and work functioning after RTW, were studied.

MAIN RESULTS

Research question 1: Which factors are associated with the risk of a long sick leave spell?

In univariate models, age, gender, duration of employment, cause and history of sick leave, salary and membership of scientific staff, were significantly associated with sick
leave duration. In multivariate models, these associations remained significant for gender, salary, age, and history and cause of sick leave. Only in medium or long spells and regarding the risk of a long or an extended spell, the explained variance of models consisting of health factors, i.e. mental disorders, work related factors, salary and gender became reasonable. Mental disorders had the strongest association with long or extended sick leave spells.

**Research question 2: Which factors are associated with first RTW and with sick leave durations in workers with common mental disorders?**

Burnout, depression and anxiety disorder were associated with longer sick leave duration. Similar, but weaker associations were found for female sex, being a teacher, small company size and moderate or high psychosocial hazard. Distress was associated with shorter sick leave duration. Medical factors, psychosocial hazard and company size were also and analogously associated with first return to work. Part-time work was associated with delayed first return to work. The strengths of the associations varied for the studied factors and different sick leave durations.

**Research question 3: Which factors are associated with job loss during sick leave?**

Among a Dutch population of 4132 employees, 3% lost their job during a sick leave spell. Job loss during sick leave was associated with mental disorder, a history of sick leave due to these disorders, lack of co-worker and supervisor support, job insecurity, and working as a civil servant or a teacher. Associations varied for gender and for company size.

**Research question 4: Which factors are associated with sustained return to work after a long sick leave spell?**

During 18 month follow-up, 31.3% employees of a Dutch university, who returned to work from a long sick leave spell (N=378) showed a sick leave frequency $> 3$ spells in 12 months and 40.9% had a cutback percentage above the university average of 3.4%. Older age, membership of scientific staff, temporary contract, and a sick leave frequency $< 3$ spells in 12 months before the long sick leave spell were associated with sustainable RTW, i.e. no sick leave or a sick leave frequency $\leq 3$ spells during follow up. No associations were found with diagnosis and work-relatedness of the long sick leave spell. Longer time to recurrence was associated with older age and job strain, shorter time to recurrence was associated with lack of support.

**Research question 5: Which factors are associated with work functioning after RTW?**

Work functioning after RTW from a long sick leave spell (defined as a spell with duration $> 6$ weeks) in the past 12 months was compared to work functioning in employees without sick leave in the past 12 months in a population of Dutch university employees. Work functioning, as measured with the Work Role Functioning Questionnaire 2.0, did not differ between the two groups, but being at work was not equal to good work functioning. In the RTW group, mental disorder as a cause for the long sick leave spell, scientific staff membership and lower self-rated health were associated with lower work functioning. In
the group with no sick leave, male gender and younger age were associated with lower work functioning. Better self-rated health was associated with better work functioning, most markedly in employees who returned to work from long sick leave.

PUTTING FACTORS INTO THE MODEL

The ICF is a biopsychosocial model in which health factors, personal factors and environmental factors in close interaction with each other determine the outcome in terms of participation. Sick leave can be considered to be a form of impaired participation in the important societal role of work. In this respect, RTW is a process directed to renewed participation in this role. In the RTW process, several phases can be distinguished. In these phases, the influence of determinants may not be constant, nor is every determinant associated with all phases of the RTW process.

In this thesis, information on determinants from all these components of the ICF model was used, either registered by the OHP in the employee's medical file, or by the employer in the employee's personnel file. Determinants were studied in relation to the different phases and outcomes of RTW. For this purpose the ICF model was extended with the phases in the RTW process as described by Young et al. (figure 1)

Figure 1. Factors and return to work outcomes in the extended ICF model
The health condition

The health condition, in this thesis represented by diagnosis, is an important factor associated with the outcome of the RTW process. Although “health condition” was operationalized as diagnosis or diagnosis category only, without taking symptom severity into account, mental disorders emerged as significant factor associated with not successful RTW outcomes. Employees with sick leave due to a mental disorder had longer sick leave duration as compared to employees with sick leave due to other disorders and they were at greater risk of job loss during this sick leave. Moreover, work functioning after RTW in employees who had returned to work from mental disorders was more impaired compared to work functioning after RTW from musculoskeletal disorders or other disorders. This was not unexpected, because mental disorders are known for their relation to sick leave,\textsuperscript{12-17} disability\textsuperscript{18-20} and work functioning.\textsuperscript{21-23} However, in a recent systematic review on prognostic factors of long-term disability due to mental disorders, the level of evidence for the relation between mental disorder and sick leave duration was qualified as limited.\textsuperscript{24}

Mental disorders often are not well defined in the Dutch OHP system with regard to diagnosis and symptom severity. The classification in Dutch OHP practice does not even allow registering symptom severity. Several studies however demonstrated that social and work functioning are determined by symptom severity,\textsuperscript{21,25,26} more than by diagnosis.\textsuperscript{25}

The effect of mental disorders on RTW outcomes is not only related to the disorder, but also to the assessment of consequences with regard to work abilities. This is an understudied field.\textsuperscript{27} In this assessment, patient-related factors, physician-related factors, legislation and stakeholder attitudes influence physicians’ decisions.\textsuperscript{27,28} Moreover, the assessment does not take place only by the OHP and other health professionals who treat the employee for the mental disorder, but also in lay persons, such as the employee and the employer.\textsuperscript{29,30}

OHPs might experience a dilemma in the client contact. On the one hand, OHPs are assisting the client in his/her RTW efforts, on the other OHPs are determining whether the client is righteously on sick leave. This dilemma is likely to influence RTW decisions of the OHP.\textsuperscript{31-33}

Environmental factors

Except work factors, environmental factors are not registered by OHPs. Some of these factors however can be extracted from personnel files, e.g. income, job type, company size, occupational branch, temporary or permanent contract and working hours per week. Psychosocial work factors were associated with duration to first RTW and sick leave duration in sick leave spells due to a mental disorder. They were also associated with job loss during sick leave and with sustained RTW. A lack of (supervisor) support was an important factor with respect to these outcomes. Psychosocial work factors also seemed to influence work functioning after RTW from long sick leave, as was suggested in the lower work functioning after RTW from long sick leave of scientific staff members.
Karlsson et al. found psychosocial work factors to be related to presenteeism and absenteeism, and showed that these relationships were mediated through employee health. These findings are also in line with a study of Allen in which a set of health measures emerged as most important single factor for outcomes such as presenteeism, absenteeism and productivity loss. However, a combined set of measures from other categories contributed also very significantly to these outcomes. Among these measures were psychosocial factors and job-, employee-, and company characteristics. Holden et al. found similar results in a study of the impact of co-morbid psychological stress on health-related productivity loss.

Other environmental factors, such as income, job type, company size, occupational branch, temporary or permanent contract and working hours per week were associated with outcome measures in the studies in this thesis, albeit not all factors were associated with all outcome measures. The findings in this thesis concerning these factors were generally in line with other studies, but results were sometimes inconclusive. The factors mentioned above cannot be influenced by the OHP. Some of these factors, especially the type of contract, can be influenced by the employer. It is important to realise that these factors influence RTW outcomes, but they cannot be easily used to intervene in RTW management.

**Personal factors**

Age and gender are among the most mentioned risk factors for sick leave duration in the literature. Their influence is often considered so important that they are treated as confounders in studies regarding sick leave duration. In the studies in this thesis, female gender was associated with higher risk of sick leave spells longer than 13 weeks as compared to shorter spells of sick leave, but not for mental disorders specifically. The risk of job loss during sick leave, for male and female gender, was associated with a partially different set of determinants. For both genders psychosocial factors, branch of occupation and company size were associated with the risk of job loss; in men diagnosis and history of sick leave were important, in women psychosocial job hazards, age and sick leave duration were associated with the risk of job loss. Gender was not associated with other RTW outcomes in this thesis. Other studies found inconclusive results for the relation between gender and RTW outcome. Age was associated with a higher risk of medium duration sick leave spells as compared to short spells, but not with long or extended sick leave spells. Age was not associated with sick leave duration in mental disorders. This is in contradiction of the results of a recent review which found strong evidence for the association between older age and longer time to RTW, but our findings corroborate the results of a study by Glise et al. in which age and gender were not associated with sick leave duration in mental disorder. Higher age was associated with a lower risk of job loss during sick leave and with higher odds of sustained RTW. Age was not associated with work functioning after RTW from a long sick leave spell, but higher age was associated with better work functioning in employees without sick leave in the past 12 months. Duration of tenure was not associated with any of the RTW outcomes in the university population.
Gender and age cannot be influenced. It also may be a matter of discussion, if personal factors such as gender and age are among the most important factors with regard to RTW outcomes. In an article of Solli and Da Silva on the biopsychosocial conception of the ICF for example, other personal factors such as motivation and goal setting are deemed to be more important than gender or age.\(^{41}\)

Another personal factor is sick leave history. Sick leave history includes previous sick leave frequency, previous sick leave duration, and previous diagnoses for which an employee has been listed sick. Both higher sick leave frequency and longer duration of previous sick leave were associated with longer time to RTW. Sick leave in the previous year was strongly associated with the risk of job loss during sick leave. A low previous sick leave frequency was associated with sustained RTW after RTW from a long sick leave spell. Previous sick leave history for a mental disorder was not associated with time to (first) RTW in mental disorders. The diagnosis of a long sick leave spell was not associated with the risk of diagnosis recurrence in a new sick leave spell. Previous sick leave frequency and duration are therefore factors to be considered in most phases of the RTW process. The association between sick leave history and time to RTW and recurrence of sick leave is described earlier,\(^{42}\) as is the association between sick leave history and job loss.\(^{43}\) These studies were carried out in a Dutch population of postal and telecommunication companies. The results in this thesis show that these associations hold also true for a Dutch university population. A recent review rated the evidence for the relation between sick leave history and long sick leave duration as limited.\(^{24}\)

Self-rated health was used as a determinant in studying work functioning after RTW, and it was associated with work functioning, more markedly so in those who returned to work from long sick leave spells. Self-rated health has also been related to the risk of sick leave in other recent studies,\(^{44,45}\) to sick leave duration\(^{46}\) and to work functioning.\(^{47}\)

**Interaction between ICF components**

Interaction between health, environmental and personal factors is an important aspect of the ICF model. It has been demonstrated in the study on job loss during sick leave in this thesis and in other studies.\(^{34-36}\) Because of these interactions, the relation with work participation may be complex. For example, an environmental factor such as lack of supervisor support is likely to have more impact on one person than on another, depending on personality, coping strategies and other personal factors. Personal factors may modify the effect of the environmental factor on work participation. Moreover, the nature of the health condition also influences the relationship between the environmental and work participation. For instance, a person with a depressive or anxiety disorder may react different than a person with an adjustment disorder when supervisor support is lacking. Environmental factors, such as psychosocial work factors, have been shown to be related to the development of mental disorders, e.g. depression or adjustment disorder \(^{48,49}\) and may influence work participation.
The nature of these interactions is complex. The analysis of the combined influence of health, environmental and personal factors on the ability to participate in work is the primary challenge for the OHP.

**STRENGTHS AND WEAKNESSES OF THE STUDIES**

A strength of the studies in the thesis is that they address several RTW outcomes. Therefore, the studies help to shift attention of RTW stakeholders from the usual dichotomous RTW outcomes (yes/no) and RTW duration to other outcomes such as job loss during sick leave, sustainability of RTW and work functioning after RTW. These outcomes have been studied seldom, if ever, before.

Another strength, regarding three out of five studies (chapter 3 – 5), concerns the data collection, i.e., these studies were not based on self-reported data but on OHPs’ assessments of employees health and work hazards, or on employers’ registrations of sick leave data and personal factors.

Some limitations have to be mentioned. Three out of five studies (chapter 2, 5 and 6) were conducted in one department of occupational health of a Dutch university. This raises the question of generisability to other branches of occupations and even more to other countries with different systems of social security benefits.

Furthermore, the study populations were relatively small. Therefore, some determinants, especially health factors and information on work hazards, had to be categorized in a rather crude way, resulting in information loss. In chapter 3 & 4, the dataset was of sufficient size to classify diagnoses into main groups of psychiatric disorders. In chapter 5 & 6, the dataset allowed only to classify diagnoses into musculoskeletal disorder, mental disorder or other disorder, and in chapter 2, the diagnosis had to be classified into mental disorder or other disorder. The same applied to the classification of psychosocial work factors. In chapter 3 & 4, the dataset allowed to distinguish between job strain, lack of co-worker support, lack of supervisor support and job insecurity, but in chapter 5 only a categorisation in job strain and lack of support was possible. In chapter 2, the classification had to be restricted to work-related sick leave vs. non-work related sick leave.

Due to small study populations and subsequent lack of power, significant associations between determinants and outcome measures could sometimes not be established.

A third limitation is the cross-sectional nature of the study, which makes it impossible to infer causal relationships. However, this was not the purpose of the thesis. This purpose was to direct attention of RTW stakeholders to sick leave cases for which an unsuccessful RTW outcome might be expected.

With regard to the ICF model some remarks have to be made also. The ICF model consists, besides of the components used in the studies in this thesis, i.e. "health condition", "environmental factors" and "personal factors", of the components “body functioning” and “activities”. Information about these last two components was not available, nor were ICF qualifiers used to measure the extent to which ICF concepts such as capacity and performance, as descriptions of respectively the components “activities” and “participation”, were influenced. Hence, although the studies reflect the biopsychosocial
nature of the ICF model, they lack detailed information on the aspects of body functioning and activities.

**IMPLICATIONS FOR OHP PRACTICE**

The findings in this thesis illustrate that health, environmental and personal factors, in the way they are recorded by OHPs and employers, are relevant to RTW outcomes. The question arises if this information is routinely used by OHPs in their decisions. Health conditions are especially important to RTW outcomes, and it is not surprising that they are a matter of great interest in RTW management. In fact, the assessment of health and bodily functioning is often the most important measure of a workers ability to resume work. However, even in a physical disorder, such as rheumatoid arthritis, biomedical function does not consistently predict work disability. In a study conducted in 60 Dutch insurance physicians Slebus et al. found, that in assessing work ability or sick leave duration prognosis, a wide range of aspects were used. In case of musculoskeletal disorders with a strong emphasis on body functions and structures, in case of mental or other disorder with a strong emphasis on participation. Aspects relating to the 'environmental factor' and 'personal factor' components were mentioned as important by fewer than 25% of the insurance physicians. These findings cast some doubt as to the extent in which OHPs would use other than health factors.

This is not surprising. The nature of workers compensation benefits in the Netherlands encourages thinking from a medical perspective, because the existence of a disease or illness as a cause for sick leave is legally mandatory for workers compensation benefits. A side effect of this medical perspective is, that it puts employees in a position where they have to stress their medical restrictions and to prove their disability in order to get financially compensated. This can hardly be seen as helpful from an empowerment perspective and can be a hindrance to RTW activities. OHPs should avoid this strictly medical perspective and take personal and environmental factors into account to create a multifactorial perspective. However, the OHPs cannot do this alone. Communication and collaboration with other physicians, physical therapists, psychologists and others health care professionals treating the employee for his/her illness, is necessary to make this multifactorial perspective effective. A Dutch study by Buijs et al. in 1999 concluded that this collaboration should be improved; a study by Anema et al. in 2006 showed that contact between OHPs and general practitioners was still infrequent.

Registration of personal and environmental factors deserves attention, but obstacles are observed. For example, the registration of work-related factors relevant to a sick leave spell fails on the level of OHPs and Occupational Health Services, because it costs too much time and this time is not financially compensated. Thus, opportunities are missed on a personal, company and societal level to gain insight in factors relevant to RTW outcomes. Registration of and reflection on these factors might also lead to a situation in which all stakeholders critically reflect on their own influence on RTW outcome. As stated before,
RTW outcome is not only determined by the disorder itself. The assessment of the consequences of the disorder with regard to work possibilities by OHPs, other physicians, employers and the sick listed employee is also important for RTW outcomes.

It seems useful to extend the registration of physical and psychosocial work hazards related to a sick leave spell. Additional to capturing the one factor that is deemed most important to the cause of sick leave, physical and psychosocial hazards for all employees should be measured, with an indication of severity. Occupational health services should develop questionnaires for this purpose, or use existing questionnaires, for example the Brief Job Content Questionnaire. This is in line with the advice of the Social and Economic Council of the Netherlands (SER). In case an employee has to list sick, information on relevant physical or psychosocial work factors is then already available, which can help to establish a proper problem analysis. In combination with preventive medical examinations, employees at risk for sick leave may even be traced and treated before sick leave, and counselled with regard to healthy ageing at work.

The information obtained in the problem analysis should be made available to a national surveillance system of sick leave and RTW, for example with the Central Bureau of Statistics (CBS). This may be done by providing CBS with a comprehensive set of data for all cases of sick leave > 6 weeks of duration.

In addition, occupational health should focus more on programmes for preventive medicine. These programmes should pay attention not only to health topics per se, but also to health-related work functioning, to improve sustainable employee health and work functioning. This is important with regard to the consequences of an ageing working population with more chronic health conditions.

**IMPLICATIONS FOR RESEARCH**

**The problem analysis in the Gatekeeper Improvement Act**

As stated before, the OHP has to write a problem analysis in the 6th week of sick leave. In this problem analysis, components of the ICF may be recognised. The OHP has to give an indication of the cause for sick leave being a health condition, and/or working conditions, conflict on the job, physical and mental job demands, personal and social factors. Apart from the cause for sick leave, the OHP has to assess impairments of the employee with regard to work functioning and the ability to work with adaptations, the relationship between employer and employee and the assessment of the risk of a disability pension.

No recent studies exist regarding the quality of the problem analysis, although an earlier panel study in OHPs and insurance physicians suggested a lack of quality. This calls for studies regarding the quality of problem analysis, and the relation of the various components of the ICF model with respect to RTW outcomes.

Furthermore, it is questionable if a problem analysis at 6 weeks is useful in all cases of sick leave > 6 weeks of duration. In case of a possible mental disorder, an earlier problem analysis could be preferable; in case of an uncomplicated physical disorder, a problem analysis may be useless. The results of the first study in this thesis (chapter 2) indicate that...
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a questionnaire at 7 days of sick leave provides useful information on the risk of long sick leave spells. Research should be directed towards the possibility to write a problem analysis only in case of an expected unsuccessful RTW outcome, based on the employee questionnaire and the OHP judgment.

Self-rated health and RTW outcomes
Self-rated health is strongly associated with work functioning. Because of the growing need for employees to continue working with a chronic disease or until higher age, the association has to be examined in future longitudinal studies. The longitudinal studies might indicate that occupational health practice should shift the focus from mainly RTW management to improving employee health, for example by offering preventive health programmes.

Job loss during sick leave
Given the lack of studies on job loss during sick leave, there is a need for larger, longitudinal studies replicating the results of this study and elucidating risk factors. The type of contract and possible causes of resignation should be taken into account, as well as severity and treatment of the disorder.

Quality of OHP diagnosis
It is not known in how many of the sick leave cases in this study or in general OHP practice the OHP diagnosis changes during the sick leave spell. More longitudinal, prospective research is needed to investigate the quality of the first diagnosis and the extent to which this first diagnosis has to be changed during the sick leave spell. Moreover, the severity of symptoms and co-morbidity, including substance abuse, should be taken into account in longitudinal studies.

Work functioning after RTW
Longitudinal research is needed to identify predictors of work functioning after RTW and to get information about the improvement of work functioning following RTW over time. A specific point of interest should be the responsiveness for change over time of the work functioning instruments used in the studies. Moreover, there is a need for studies on interventions specifically designed to improve health-related work functioning after initial (full) RTW.

Sustainable RTW
More and longitudinal research is needed to identify factors involved in RTW sustainability, including psychosocial work hazards and type of contract. Employees with temporary contracts showed some level of presenteeism, i.e. working while sick. In future studies, presenteeism should be assessed structurally, for example by measurement of health-related work functioning after RTW. Measurement should take place not only
among employees with temporary contracts and preferably over a longer time period after RTW.

**Phase specificity of RTW**

Of special interest was, whether associations between health, environmental en personal determinants and different RTW outcomes vary in different phases of the RTW process. The studies suggest phase-specificity. However, differences are not always significant and because of the cross sectional nature of the study no conclusions with regard to causality can be inferred. Longitudinal studies, specifically aimed at phase-specificity are needed to clarify the associations. This is important for a better understanding of the influence of factors on RTW outcomes, and may thereby support the choice and timing of interventions.

**CONCLUSION**

The data on factors used as determinants in this thesis are either collected by OHPs in the course of RTW management or accessible in personnel files of the employer. These factors are not only associated with (time to) RTW but also with other RTW outcomes, such as job loss, RTW sustainability and work functioning after RTW. Longitudinal research is needed to confirm these associations, and to make sure that these factors are important to direct preventive measures to improve RTW outcomes as studied in this thesis. With an ageing work force in which more and more employees will suffer from chronic disease, OHPs should redirect their focus from mere RTW management to improving sustainable employability of the work force. Important information to guide OHPs is at their fingertips in OHP files.
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